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PATENTIN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: HENNHÖFER ET AL

SERIAL NO.: 09/032,305

EXAMINER: R. KUNEMUND

FILED: FEBRUARY 27, 1998 GROUP: 1765

TITLE: PROCESS FOR TREATING A POLISHED SEMICONDUCTOR
WAFER IMMEDIATELY AFTER THE SEMICONDUCTOR WAFER
HAS BEEN POLISHED

DECLARATION UNDER RULE 132

ATT: BOX FEE AMENDMENT
Assistant Commissioner for Patents
Washington, D.C. 20231

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SEP 23 2002

TC 1700

Dear Sir:

I, Heinrich Hennhöfer, declare:

That I am a German citizen residing at Sr.-Edith-Stein-
Strasse 5, 84503 Altötting, Germany;

that I am a joint inventor of the invention described and
claimed in the above-identified patent application;

that I have received, and have read, and understand, the
Non-Final Office Action dated April 19, 2002, in the above-
identified patent application;

that I have read and understand the prior art references
applied by the Patent Examiner in the Office Action dated
April 19, 2002, namely the *Fabry* U.S. Patent No. 5,219,613, the

Hayashida U.S. Patent No. 5,580,846, and the Lampert U.S. Patent No. 4,692,223;

that I studied technical chemistry at the University of Nürnberg and graduated with a Degree as an engineer (Dipl. Ing. (FH));

that I started working at Wacker in the development group for polishing in 1980;

that I designed new polishing slurries for 100mm and 150mm silicon semiconductor wafers;

that I transferred the new 150mm process to the Fab in Portland, Oregon;

that I developed a new machine type and process for 200mm semiconductor wafers;

that I installed a developed system in the 200mm Fab in Wasserburg, Germany;

that I designed a study for 300mm wafer processing;

that I developed equipment and process for final polishing in the 300mm wafer project;

that I started up equipment in the 300mm wafer pilot line;

that currently, I am responsible for the process step "final polishing" in the 300mm wafer pilot line;

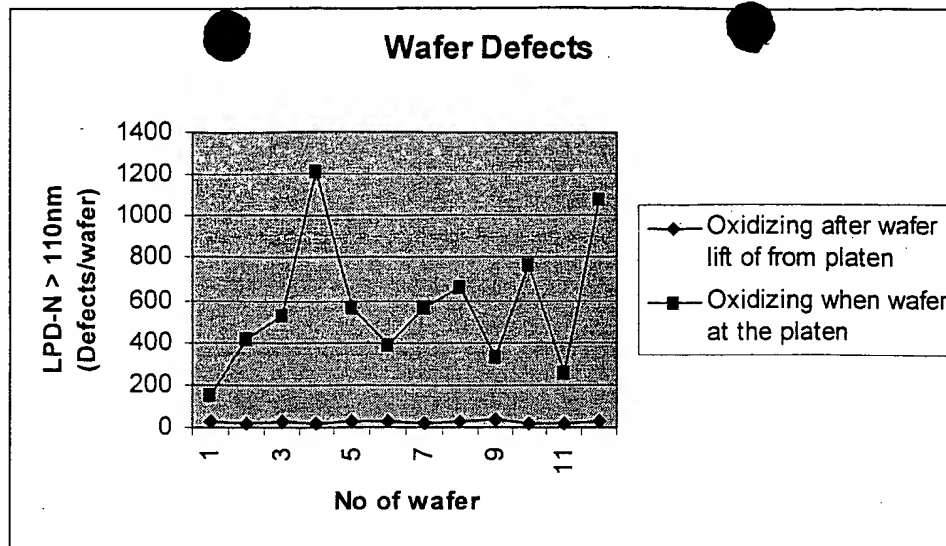
that a Comparative Testing Program was conducted under my supervision;

that the semiconductor wafers were measured by a SP1 from Tencor, the measuring system being a laser beam which scans the wafer surface, and the scattered light being detected; and based on the intensity of this scattered light the wafer defect can be calculated;

that the Patent Examiner correctly states in the recent Office Action that the timing of the process steps is one of the crucial points which delimits the present invention from the cited prior art;

that according to the present invention it is crucial to bring a polished semiconductor wafer into contact with an oxidizing agent right after having removed the wafer from a polishing plate; and any procedure which differs from this sequence is going to have serious drawbacks;

that I prepared the following diagram containing the Comparative Testing results;



that based on this diagram, *Lampert et al.* intended to form an oxide film on the wafers by adding an oxidizing agent to the wafers while the wafers were still lying on the polishing platen in order to stop the polishing process and to protect the wafer surface by the oxide film; however, this method is connected with the drawback that the forming oxide film will be partly destroyed by the mechanical action of the rotating polishing platen; since there are locations which are not protected by an oxide film semiconductor material is removed by the action of the polishing agent which is still present; this finally leads to defects which can afterwards be detected on the wafer surface as shown in the above diagram;

that moreover, if the oxidizing agent is supplied when the wafers are still lying on the polishing plate, the polishing of subsequent wafers is impaired unless the oxidizing agent is

thoroughly removed from the polishing plate;

that the Patent Examiner has stated in the Office Action that *Lampert et al.* would teach that the steps were to be done as soon as possible; however, it is also disclosed that as soon as possible has to be interpreted as meaning as soon as possible while the wafers are still lying on the polishing platen; *Lampert et al.* teaches adding an oxidizing agent, at the end of the polishing step, to the alkaline polishing agent flowing onto the workpiece surface (See column 1, lines 60-64); and according to both examples given at the end of this reference, the wafers are still in the polishing machine when the oxidizing agent is added;

that therefore, as *Lampert et al.* do not disclose removing the wafer from the polishing plate before the oxidizing treatment, this document clearly leads away from the present invention;

that accordingly, even if the *Fabry et al.* reference is modified in accordance with the teaching of *Lampert et al.* one skilled in the art would not arrive at the presently claimed

process; and

that I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date:

3.09.02


HEINRICH HENNHÖFER